

Appln. No. 09/785,072
Amendment dated December 30, 2003
Reply to Office Action of September 30, 2003

Attorney Docket No. 70207

REMARKS/ARGUMENTS

In Office Action mailed on September 30, 2003, the Examiner rejected claim 18, under 35 U.S.C. §112, first paragraph, as failing to comply with the description. By this amendment applicants amended claim 18, changing “silicon carbide” to --silicone carbide-- to correct a typing error and to overcome Examiner’s §112 rejection. Also, in Claim 17 the word “composition” was replaced by the word “material”, which seems more appropriate for defining the hard material of the body.

Applicants appreciate the thoroughness of the examination and the resultant Office Action. The Examiner’s acknowledgment that claims 13, 19, and 23 recite allowable subject matter is appreciated. Claims 13, 19 and 23 were amended as suggested by the Examiner, incorporating all the limitations of the base claims 1, 20 and 21, respectively.

REJECTION UNDER 35 U.S.C. §102(b)

Claims 1, 8, 9, 12, 13, 17 and 19 were rejected under 35 U.S.C. §102(b) as anticipated by Lem et al. (WO 91/07632), and Claims 2, 7, 9, 20 and 21 were rejected under 35 U.S.C. §102(b) as anticipated by Skelton et al. (EP 0151011). Applicants appreciate the time and consideration provided by the Examiner in reviewing this application, however, respectfully traverse the rejection of the claims at least for the following reasons.

Anticipation under 35 U.S.C. §102 requires that each and every claimed feature be disclosed by a single prior art reference. Therefore, the prior art reference relied upon by the Examiner must disclose an article that is reasonably identical to and includes at least every material element of the claimed ballistic armor panel.

Lem et al. (WO 91/07632)

Applicant respectfully submits that Lem et al. do not disclose, or suggest, each and every claimed feature of the subject invention.

In the previous prosecution we have already explained that in accordance with the invention the armor panel consists of a sole board, which carries plurality of discrete hard bodies retained within adjoining through-going apertures made in the board.

The board has a peripheral portion and a receiving portion in which the apertures are distributed. Both portions are integral parts of the same board. There are no any additional elements, which assist to accommodate the bodies in the board. The apertures are distributed within the board in such a manner that the board has meshed, cellular structure, in which the adjacent meshes are situated as close as possible in order to keep the thickness of the wall therebetween at a minimum. By virtue of this provision it is possible to increase the surface protected by the bodies and at the same time to reduce the weight of the panel.

In Lem et al. is described multilayer ballistic resistant composite armor, which has sandwiched structure. The upper protective layer consists of an impact layer 12 carrying one or more ceramic bodies 20 and of a separate backing layer 18 supporting the impact layer. The layer 12 comprises two separate items, i.e., a peripheral retaining means 14, which frames the impact layer and a peripheral retaining means 16, which is configured as a grid defining an interconnected network. The peripheral retaining means 16 defines individual cells confining ceramic bodies, which occupy the cells.

Example I of the specification to Lem et al. explicitly mentions how the armor is constructed. It is said, that the armor consists of a checkerboard divided by aluminum barrier wall into cells and that this board is placed into aluminum frame. Each cell accommodates one ceramic tile made of Alumina. In other words, the ceramic tiles are not located within apertures, which were drilled in a single body, but are deployed in cells organized by three separate elements, i.e. backing layer, peripheral frame and internal grid.

This complicated construction is employed in Lem et al. in order to absorb vibration energy produced on impact of the projectile. Lem et al. explicitly teaches that in ballistic resistance armor, which is made of ceramic tiles connected to a metal substrate this energy can be transmitted as noise and shock and substantially reduce the multiple hit capability of such armor (p. 2, lines 15-25). The structure of Lem et al. does not consists of cells, which are

arranged to intentionally keep the distance between the adjacent cells at a minimum (as in the present invention).

In the present invention the bodies are arranged to distribute the impact force and to dissipate it in a most efficient way by the ceramic bodies. This is achieved on account of the claimed honeycomb structure, which allows distributing polygonal bodies with maximum of surface density, i.e., with a minimum wall thickness between the adjoining apertures. Since in the present the apertures are made in the board this distance could be kept at its minimum. In practice this distance lies between 0.5 mm to 1 mm. In Lem et al., which employs dedicated grid to arrange cells, this distance is 15 mm (see Example I).

Moreover, the word honeycomb, which was used for defining the board structure, does not necessarily mean cells with hexagonal cross-section. For example from the previously presented Webster Encyclopedic Dictionary one can understand that the meanings of this word is anything containing many small units or holes and resembling a structure of rows of hexagonal wax cells. In the specification to present application it is explicitly mentioned that polygonal apertures may have any other polygonal shape e.g. triangular, square, heptagonal, etc. To better define the board cellular structure Applicants amended Claim 1 to define the structure by the word "meshed".

By this Amendment, the definition of the board's destination was added into Claim 1 and the board as a single part has been emphasized. The structure of the receiving portion was also defined as a meshed structure and it was indicated how the apertures are distributed within the receiving portion. In making these revisions care has been taken that the claims remain supported by the specification and that no new matter is added.

In view of the foregoing, it is submitted that Claim 1 as amended by this response is not anticipated by Lem.

Skelton et al. (EP151011)

Skelton et al. does not disclose or suggest “a ballistic armor panel”, which is suitable for protection against small arms bullets and kinetic energy projectiles (as the present invention). The security barrier structure disclosed in Skelton et al. is an anti-drill barrier for a safe to render it resistant to a drilling operation seeking access to the safe. Skelton et al. described a steel plate provided with plurality of cylindrical holes with inserted cemented carbide pins. The pins are tapered along their length and have circular cross-section. Since the holes are cylindrical and the pins are tapered, their respective cross-sections are not matching along the whole longitudinal axis of the pins and by virtue of this provision the pins can be retained in the holes due to interference fit arising when the pins are pressed into the holes.

In contrast, in the present invention the bodies and the apertures accommodating them are provided with polygonal cross-sections, which correspond to each other along their longitudinal axes.

Based on the above, Applicants respectfully submit that Skelton et al. does not disclose each and every feature of the amended main claim 1 and of the independent claims 20-22, and therefore does not anticipate either of them.

In paragraph 7 of the Office Action, the Examiner alleges that Claim 18 is obvious over Skelton et al. in view of Glaser (US 3,634,177). In particular the Examiner alleges that one of ordinary skill would have found it obvious to make the panel of Skelton et al. using silicone carbide as disclosed by Glaser, since “the suggestion/motivation for doing so would have been to make the board transparent”.

This allegation is an evident mistake since Claim 18 has nothing to do with imparting transparency to the board. The allegation is not correct also because of the following reasons:

1. Glaser does not mention silicone carbide for use in the lightweight transparent penetration-resistant structure
2. Silicon carbide is not transparent

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3. There is absolutely no motivation or suggestion in Skelton et al. to make its panel transparent.

4. It would not be possible to employ pressing and interference fit for retaining cemented carbide pins in a plate made of silicone carbide, because silicone carbide is very brittle.

Reconsideration of Claim 1, as now presented and all dependent claims is respectfully solicited.

As to the rest of claims, i.e., dependent Claims 8, 9, 12 and 17, they should be considered allowable since they include all the limitations of the allowable base claim 1.

Also, Applicants were surprised to find that Claims 20-22 introduced in Amendment filed on June 27, 2003, were not allowed, since these claims represent Claims 6, 10 and 11 rewritten as suggested by the Examiner in the Office Action mailed on March 3, 2003.

Moreover, with regards to Allowable Subject Matter, Applicants believe that Auyer (US 5,014,593) should not be applied since it is explicitly set out in Claim 1 and 20 (from which the allowable Claims 13, 19, 23 depend) that polygonal shape of the bodies corresponds to the shape of the apertures.

Based on the above, Applicants respectfully request favorable reconsideration of the Examiner's rejection and allowance of the pending claims.

The Commissioner is hereby authorized to charge any additional fees which may be required in this application to Deposit Account No. 06-1135.

Respectfully submitted,

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